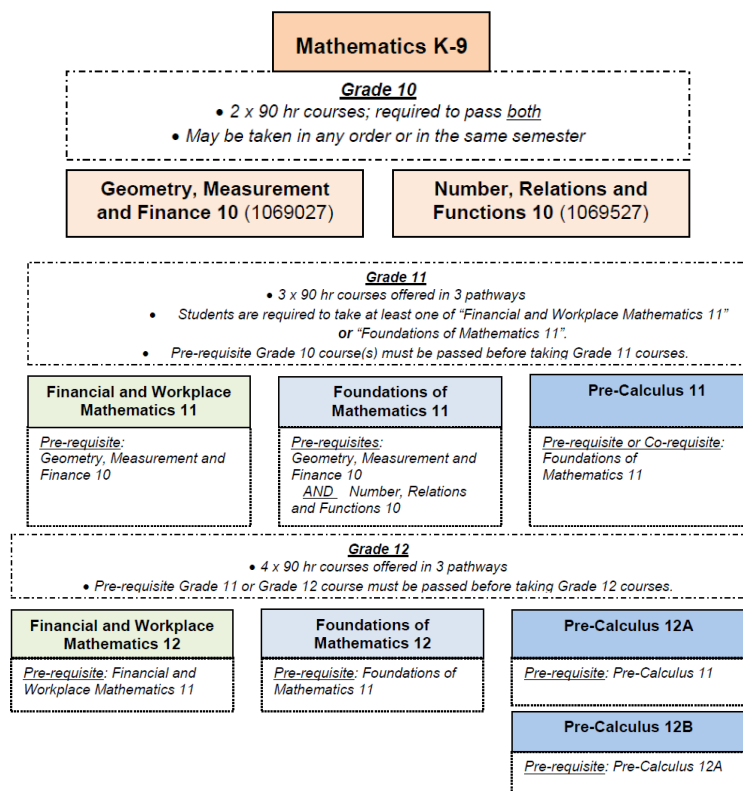


# Welcome to Geometry, Measurement, and Finance 10

This diagram shows you what math courses you NEED in order to graduate....it also shows you the math courses that are available to you if you wish to take them



### To succeed this semester:

- Pay attention during lessons
- Ask for help when you need it (don't wait too long)
- Do your best quality work!
- Complete your assigned work on time

Extra Help: Tuesday's and Thursday's at lunch hour

Check out our class website: <http://belyea.wikispaces.com>

- Class notes/lessons
- Assignments
- Calendar
  - Daily homework Assignments
  - Upcoming test or quiz dates
  - Assignment due dates

#### Topics to be covered:

Unit 1: **Numbers** (Finance problems; involving income, interest, and credit)

Unit 2: **Measurement** (SI units & imperial units, Volume, and Surface Area)

Unit 3: **Geometry** (Pythagorean Theorem, Trigonometric ratios, parallel/perpendicular lines, angles)

#### Materials Required:

Binder with loose-leaf

**Scientific calculator**

Pencils/Eraser

Graph paper

**Geometry Set**

Exercise Book (no coils)

#### Textbook:

**MathWorks 10, Pacific Educational Press.** Students are assigned numbered textbooks and are responsible for returning the same textbook, in the same condition, at the end of the course. If the student does not return the book at the end of the course, then the cost of replacing the book must be paid to the school (**approximately \$65.00**).

## GMF Math 10 Units & Outcomes

<i>February</i>	<i>March</i>	<i>April-May</i>	<i>January</i>
Unit 1: Numbers (N1-5): (4 weeks)	Unit 2: Measurement  (M1-5): (4 weeks)	Unit 3: Geometry (G1-5): (8 weeks)	Exam Review: (1 week)
<b>N1-N5</b> Solve finance problems using proportional reasoning, demonstrate an understanding of income, compound interest, financial institution services and credit options.	<b>M1-M5</b> Demonstrate an understanding of SI units & imperial units, solve problems in linear, 2D (area) and 3D (volume)	<b>G1-G5</b> Apply the Pythagorean theorem and trigonometric ratios, solve problems involving parallel, perpendicular lines and the angles formed between them.	<b>A1 &amp; G1</b> Algebra (A1) and Geometry (G1) Develop Algebraic reasoning & analyze puzzles and games (covered throughout semester)

## Geometry, Measurement, and Finance 10

### Unit 1: Numbers (Finance)

First outcome to be covered:

N1: Solve problems that involve unit pricing, currency exchange, using proportional reasoning.

- ratios, proportions
- shopping, calculating taxes
- estimation, discounts, shipping costs
- product quality and practicality

Read over the following problem... How would you find the answer?

#### MATH ON THE JOB

"In 1997, I moved back to the old family homestead, turning the place into an organic, small plot gardening, herb farm and an informal learning centre. We grow food, flowers, garlic, herbs, and wheatgrass," says Pam Trenholm. Pam is a farmer who operates Brighton Botanicals, located near Hartland, New Brunswick. She attended Hartland High School and later took business courses at Carleton County Vocational School in Woodstock, New Brunswick.

Pam's job includes ordering seeds, selling produce, and planting and caring for crops. Pam needs to fertilize a crop with an organic liquid fertilizer that is mixed with water. Five hundred mL of fertilizer is mixed with 60 L of water. If Pam is using 750 mL of fertilizer, how much water does she need to add? How can Pam use proportional reasoning to solve this problem?



Pam (right) and her intern check plants to see if they have received enough nutrients.

500 ml fert      60 L water  
750 ml fert      ? (90L)

$$\frac{500 \text{ ml}}{60 \text{ L}} = \frac{750}{x}$$

$$750 \times \frac{60}{500} = \frac{x}{750} \times 750$$

$$90 = x$$

### Friday, February 3<sup>rd</sup>

- Reminder: Extra help Tuesday's and Thursday's at lunch hour
- Next Test/Quiz: Proportional Reasoning Quiz on Friday, February 10<sup>th</sup>

#### Today:

- Review some vocabulary - copy
- Do some practice questions together - copy
- Classwork/Homework (Practice questions/worksheet)

In order to be able to use proportional reasoning to solve problems, we need to know how to write ratios and solve proportions VERY well.

Please create a page specifically for a list of Unit 1 Vocabulary

You will learn SEVERAL vocabulary terms during this unit. You will be responsible for understanding the meaning of each one.

## Ratio

pg12

Ratio: a comparison between two numbers with the same units

- When working with ratios, simplify them first.\*
- Simplifying a ratio is just like simplifying fractions
- Ratios can be written in 3 ways

ex. 3 cans of water to 4 cans of orange juice

3 to 4      3:4       $\frac{3}{4}$

Remember that a ratio compares two numbers that are measured in the same units. A ratio can be written in several ways. For example, the ratio 20 to 50 can be written as 20:50 or as  $\frac{20}{50}$ . The notation  $\frac{20}{50}$  is often the most useful notation because your knowledge of fractions can be used in calculations.

When working with ratios, simplify them first. For example, the ratio 20:50 can be simplified by dividing each term by 10. To solve calculations using this ratio, you can use 2:5 instead of 20:50.

Ratios are often expressed in real-life situations as proportions. For example, you may need to mix a certain shade of paint. The proportion needed is 3 parts blue to 1 part green, or 3:1. You can use this ratio to mix the amount of paint you need in the correct proportions. Mixing 3 parts and 1 part means there are 4 parts in all.

$$\frac{20}{50} \div 10 = \frac{2}{5}$$

Ratios are normally written in simplest form.

Ex.  $\frac{10}{20} = \frac{1}{2}$      $\frac{4}{2} = \frac{2}{1}$      $\frac{2}{18} = \frac{1}{9}$      $\frac{20}{12} = \frac{5}{3}$

## RATE

- A rate is similar to a ratio, but it compares two numbers with different units.
- is per unit (for unit rate)
- Can be expressed the same way

Examples:

- 100 km in 1 hour (speed)
- the number of words you can type per minute
- the number of hamburgers a concession stand sells each day
- the price of lumber per linear foot

Two hand-drawn circles illustrate rates. The first circle is labeled 'Rate' and contains the fraction  $\frac{100 \text{ km}}{2 \text{ hr}}$ . The second circle is labeled 'Unit Rate' and contains the fraction  $\frac{50 \text{ km}}{1 \text{ hr}}$ .

## Writing a Proportion

Proportion: a fractional statement of equality between two ratios or rates

- Units must match! (the numerators must be the same, and the denominators must be the same)
- The unknown can be on the top of the fraction or the bottom
- There are several methods to solving a proportion

Example #1 (Pg.13)

Engines requiring a mixture of oil and fuel to provide lubrication are called 2-stroke engines. Lisa lives in McCallum, Newfoundland, and uses her boat for transportation. Her boat motor's tank holds 25 L of fuel. The ratio of gasoline to oil required is 50 parts of gasoline to 1 part of oil. Lisa mixes the fuel and oil in a ~~30-L~~ jerry can before filling up her boat's tank. How much oil should be added to the gasoline?

\* When the unknown is on the bottom, flip both fractions.

$$\frac{50 \text{ parts gas}}{1 \text{ part oil}} = \frac{25}{x}$$

$$25 \times \frac{1}{50} = \frac{x}{25} \times 25$$

$$0.5 = x$$

## Writing a Proportion

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Engines requiring a mixture of oil and fuel to provide lubrication are called 2-stroke engines. Lisa lives in McCallum, Newfoundland, and uses her boat for transportation. Her boat motor's tank holds 25 L of fuel. The ratio of gasoline to oil required is 50 parts of gasoline to 1 part of oil. Lisa mixes the fuel and oil in a 30-L jerry can before filling up her boat's tank. How much oil should be added to the gasoline?

\* Hint: When the unknown is on the bottom, flip both fractions

$$\frac{50}{1} = \frac{25}{x}$$

$$25 \times \frac{1}{50} = \frac{x}{25} \times 25$$

$$0.5 = x$$

$$x = 0.5 \text{ L}$$

## Writing a Proportion

### Example #1 (Pg.18)

If halibut steaks cost \$2.49 for 100 g, how much will it cost to buy 250 g of halibut steaks?

$$250, \frac{2.49}{100} = \frac{x}{250} \times 250$$

$\times \$6.225$   
 $\$6.23$



*A fisherman in Bottle Cove, Newfoundland, with a freshly caught halibut.*



## Writing a Proportion

### Example #2 (Pg.20)

A local plumbing store sells 100 copper-plated pipe straps for \$4.97. You have estimated that you require 75 straps. How much will you pay for 75 straps?

$$75 \times \frac{4.97}{100} = \frac{x}{\cancel{75}} \times \cancel{75}$$

$x = 3.7275$   
 $x = \$3.73$

## Practice Solving Proportions:

Example #1:

$$\frac{x}{16} = \frac{5}{24}$$

Example #2:

$$\frac{150}{x} = \frac{30}{7}$$

## Monday, February 6<sup>th</sup>

- Reminder: Extra help Tuesday's and Thursday's at lunch hour
- Next Test/Quiz: Proportional Reasoning Quiz on Friday, February 10<sup>th</sup>
- Next Assignment Due: Friday, Feb.10th

### Today:

- Warm-up #1 (please get out your new warm-up book)
- Practice Questions
- Copy down questions for Assignment due Friday
- Worksheet/Assignment
- Classwork/Homework (Practice questions/worksheet)

## Warm-up #1



#1 Is this a ratio, rate, or unit rate?

$$a) \frac{10 \text{ Kg}}{5 \text{ L}}$$

$$b) \frac{6 \text{ girls}}{5 \text{ boys}}$$

$$c) \frac{110 \text{ km}}{1 \text{ hr.}}$$

#2 Write and Solve each proportion:

Oliver's restaurant purchases a 5-kg jar of olives for \$15.00 through a wholesaler.

- How many kilograms would it get for \$75.00?
- How much would it cost the restaurant to buy 20 kilograms?

# Practice Solving Proportions:

## Copy & Complete

First estimate your answer, then solve for  $x$ . Compare the estimated and calculated answers to check if your answer is correct.

a)  $\frac{2.68}{5 \text{ rolls}} = \frac{x}{1 \text{ roll}}$

b)  $\frac{x}{300} = \frac{1}{1.56}$

(Show me the proportions set up first...)

c) A box of 12 pencils costs \$1.69. How much does one pencil cost?

## Assignment #1

due Friday, Feb. 10

- The following questions are due on Friday.
- These are not to be completed on the worksheets. Complete all questions on loose leaf (using PENCIL) and show all work!
- Pass all questions/answers in together as ONE assignment.

From worksheet #1:

#17 to 20

#35 to 40

Solve for the unknown

Find the unit rate

COPY  
THESE  
DOWN

From worksheet #2:

# 8 to 14

Set up the proportion and

Solve for the unknown

From textbook:

Page 26 #5

Answer and show ALL work

# Classwork/Homework

(if not completed in class, must be completed for homework)

## Ratio, Rate, and Proportion Worksheet #1

Answer questions:

# 1 to 7, 21 to 28

## Ratio, Rate, and Proportion Worksheet #2

Answer questions:

# 1-5

## Textbook questions:

Answer questions:

Page 21 #1-3 & 6